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Consortium Develops System Combining Design of Manufacturing Product and Process

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CONSORTIUM DEVELOPS SYSTEM COMBINING DESIGN OF MANUFACTURING PRODUCT AND PROCESS

DAYTON, Ohio -- A team of University of Dayton engineers has helped create the most complete computer system yet developed to integrate the design of a product and the manufacturing process used to make it.

The system has the potential to shorten the time it takes to develop a product and eliminate some manufacturing costs, says John Eimermacher, professor of mechanical and aerospace engineering, who leads the UD team.

In most CAD/CAM systems, designers connect lines, circles, arcs, cylinders, blocks and other "primitives" to make product features such as holes, pockets and slots. The Rapid Design System (RDS), however, uses feature-based modeling techniques in which features already have been designed and stored in the program.

"We take the design and develop a machining operations process plan--a step-by-step procedure defining the tooling, the machines to be used and the speeds and feeds to get from the raw block of metal to the final configuration," says Eimermacher. "The system automatically evaluates the design and process simultaneously. Users may not be familiar with all the details of manufacturing, but the system will lead them through this process.

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"The other issue that is addressed in addition to the process plan is a numerical control code/tape, which is used in a machining center to generate the part. So the two products of our fabrication planning subsystem are a process plan and a numerical control code/tape that can be directly transferred to a machine to cut parts."

The UD team is working with researchers from several other universities and organizations, including Case Western Reserve University, Cornell University, the University of Cincinnati, Wright State University and Wright-Patterson Air Force Base's Materials Directorate. Case Western has focused on design features and memory and UD on the manufacturing process--the "fabrication planning subsystem." The Wright Laboratory, Materials Directorate is the lead organization in the project.

The RDS is being developed for the U.S. Air Force's 4950th Test Wing, which is piloting the system. RDS also was demonstrated Nov. 12-14 in Chicago at Autofact '91, North America's largest exposition and conference for automated and computer-integrated manufacturing.

The Miami Valley Research Institute's Center for Artificial Intelligence Applications is funding UD's participation in the project. Since the project began in September 1988, the center has awarded UD $437,475.

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For media interviews, contact **John Eimermacher** at (513) 229-2990.